

(11) CLAIM OR CLAIMS:

1 1. A bone graft substitute composition comprising:

2 (a) calcium sulfate;

3 (b) a mixing solution selected from the group consisting of sterile water, inorganic
4 salts, and cationic surface active agents including sodium chloride, phosphate buffered
5 saline, potassium chloride, sodium sulfate, ammonium sulfate, ammonium acetate, and
6 sodium acetate; and

7 (c) a plasticizing substance selected from the group consisting of cellulose
8 derivatives including sodium carboxymethylcellulose, methycellulose, hydroxypropyl
9 methylcellulose, ethylcellulose, hydroxyethylcellulose and cellulose acetate butyrate, and
10 higher molecular weight alcohols including glycerol and vinyl alcohols.

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1 2. The bone graft substitute composition of claim 1 in which is included
2 demineralized bone matrix.

1 3. The bone graft substitute composition of claim 2 in which said composition is
2 approximately 40% demineralized bone matrix by dry weight.

1 4. The bone graft substitute composition of claim 2 in which said composition is
2 approximately 100 parts calcium sulfate by weight, 11.1 parts carboxymethylcellulose by
3 weight, 162 parts water by weight, and 69.4 parts demineralized bone matrix by weight.

1 5. The bone graft substitute composition of claim 1 in which said composition is
2 approximately 100 parts calcium sulfate by weight, 6.3 parts carboxymethylcellulose by

3 weight, and 31 parts water by weight.

1 6. The bone graft substitute composition of claim 1 in which said composition is
2 approximately 100 parts calcium sulfate by weight, 1.2 parts carboxymethylcellulose by
3 weight, and 31 parts water by weight.

1 7. The bone graft substitute composition of claim 1 in which said composition is
2 approximately 80-120 parts calcium sulfate by weight, 1-40 parts
3 carboxymethylcellulose by weight, and 21-250 parts water by weight.

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1 8. The bone graft substitute composition of claim 1 in which is included a
2 bioactive agent selected from the group consisting of demineralized bone matrix, growth
3 factors, hyaluronic acid, bone morphogenic proteins, bone autograft, therapeutic agents,
4 analgesics, and bone marrow, bone allograft, and parenchymal and mesenchymal cells.

1 9. The bone graft substitute composition of claim 1 in which is included sodium
2 bicarbonate.

1 10. A bone graft substitute composition comprising:
2 (a) calcium sulfate;
3 (b) a mixing solution; and
4 (c) a plasticizing substance for extending the set time of the resultant composition
5 and for providing the resultant composition with sufficient robustness to withstand fluid
6 impact with minimal erosion.

1 11. A bone graft substitute composition comprising:

2 (a) approximately 80-120 parts medical grade calcium sulfate hemihydrate by
3 weight;

4 (b) approximately 21-250 parts sterile water by weight; and

5 (c) approximately 1-40 parts sodium carboxymethylcellulose by weight.

1 12. The bone graft substitute of claim 11 in which is included approximately 10-
2 100 parts demineralized bone matrix by weight.

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